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(54) SEMICONDUCTOR DEVICE AND ITS
PRODUCTION

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(57) Abstract:

PURPOSE: To reduce threshold voltage shift due to the fixed charge of a gate insulating film and suppress hot carrier deterioration due to channel hot electron injection.

CONSTITUTION: A gate insulating film 102 is permitted to have double layer structure composed of a nitride oxide film 106, which contains $10^{19}/\text{cm}^3$ or more nitrogen atoms that constitute the interface between a channel area, and a silicon oxide film 107 which contains nitrogen atoms arranged on the nitride oxide film 106 by a concentration of $10^{19}/\text{cm}^3$ or less. Therefore, high resistance for the interface level due to hot carrier injection is provided by the high concentration nitrogen atoms on the interface between the silicon board and since the nitrogen atom concentration is low at other parts, the average nitrogen concentration of the whole gate insulating film is reduced, a fixed charge is reduced, an oxide film trap becomes less and the hot carrier injection is suppressed.

